

In the Claims:

What is claimed is:

1. (original) A VLAN tagging unit having multiple logical interfaces, different logical interfaces on the VLAN tagging unit being associated with different customer networks, the customer networks transmitting data to the VLAN tagging unit across a WAN, the VLAN tagging unit producing a VLAN ID for data associated with a customer network, the production of the VLAN ID depending at least partially on the logical interface of the VLAN tagging unit on which the data is received, the VLAN tagging unit using the VLAN ID to produce VLAN frames to sent to additional network elements.
2. (original) The VLAN tagging unit of claim 1 wherein one logical interface comprises a physical port.
3. (original) The VLAN tagging unit of claim 2 wherein one logical interface comprises a T1 port.
4. (original) The VLAN tagging unit of claim 1, wherein one logical interface comprises a DS3, CT3 or E1 port.
5. (original) The VLAN tagging unit of claim 2 wherein at least one logical interface comprises an Ethernet port.
6. (original) The VLAN tagging unit of claim 1 wherein at least one logical interface comprises a portion of a physical port.
7. (original) The VLAN tagging unit of claim 6 wherein the portion of the physical port comprises a fraction al T1.
8. (original) The VLAN tagging unit of claim 1 wherein a logical information comprises a multi link combination of multiple ports.

9. (original) The VLAN tagging unit of claim 8 wherein the multilink combination of ports is a multilink combination of T1 ports.

10. (original) The VLAN tagging unit of claim 1 wherein at least one logical interface comprises an virtual circuit.

11. (original) The VLAN tagging unit of claim 1 wherein at least one logical interface comprises an aggregated virtual circuit.

12. (original) The VLAN tagging unit of claim 1 wherein the customer networks are not associated into VLAN IDs.

13. (original) The VLAN tagging unit of claim 1 wherein the customer networks are associated into VLANs using VLAN IDs.

14. (original) The VLAN tagging unit of claim 13 wherein another VLAN tagging unit is used to strip the VLAN header from packets before sending it to the first VLAN tagging unit.

15. (original) The system of claim 1 wherein the VLAN ID depends upon other information such that multiple VLAN IDs can be used for data received at the same logical interface.

16. (original) The VLAN tagging unit of claim 1 wherein only the logical interface is used to determine the tagged VLAN ID.

17. (original) The VLAN tagging unit of claim 1 further includes a VLAN table associating VLAN IDs and associated logical interfaces.

18. (original) The system of claim 1 wherein when data associated with a VLAN ID is received it is forwarded to each of the associated logical interfaces other than the logical interface on which the data is received.

19. (original) The VLAN tagging unit of claim 1 wherein service parameters are further associated with the VLAN IDs, the service parameter affecting data passing through the VLAN tagging unit.
20. (original) The VLAN tagging unit of claim 1 wherein data from multiple VLAN having different VLAN IDs are sent across the same WAN connection, with a quality of service indication determining how the bandwidth is divided between the VLANs, the quality of service indication associated with a VLAN ID.
21. (original) The VLAN tagging unit of claim 1 further comprising network address translation for IP addresses based on VLAN ID.
22. (original) The VLAN tagging unit of claim 1 wherein at least one VLAN ID is a management ID that allows the management of network elements such that elements associated with other VLAN IDs cannot access the management function.
23. (original) The VLAN tagging unit of claim 1 wherein the VLAN tagging unit is adapted to associate flows coming to the unit into separate VLAN IDs such that elements in at least one network portion can handle the flows differently.
24. (original) The VLAN tagging unit of claim 1 wherein the VLAN tagging unit has a VLAN table of VLAN IDs and associated logical interfaces, the VLAN table being dynamically updated during operation of the VLAN tagging unit.
25. (original) A VLAN tagging unit having multiple logical interfaces, different logical interfaces on the VLAN tagging unit being associated with different customer networks, the customer networks transmitting data to the VLAN tagging unit across a WAN, the VLAN tagging unit producing a VLAN ID for data associated with a customer network, the production of the VLAN ID depending at least partially on the logical interface of the VLAN tagging unit on which the data is received, the VLAN ID further depending upon other information such that multiple VLAN IDs can be used for data received at the same logical interface, the VLAN tagging unit using the VLAN ID to produce VLAN frames to sent to additional network elements.

26. (original) The VLAN tagging unit of claim 25 wherein at least one logical interface comprises a multi-link of T1s.
27. (original) The VLAN tagging unit of claim 25 wherein in at least one logical interface comprises an Ethernet port.
28. (original) The VLAN tagging unit of claim 25 wherein at least one logical interface comprises a T1 port.
29. (original) The VLAN tagging unit of claim 25, wherein at least one logical interface comprises a DS3, CT3 or E1 port.
30. (original) The VLAN tagging unit of claim 25 wherein the customer networks are not associated into VLANs.
31. (original) The VLAN tagging unit of claim 25 wherein the customer networks are associated into VLANs having VLAN IDs.
32. (original) The VLAN tagging unit of claim 31 wherein another VLAN tagging unit strips the VLAN header from the data from the customer network before transmitting the data from the another VLAN tagging unit to the first VLAN tagging unit.
33. (original) The VLAN tagging unit of claim 25 wherein the VLAN tagging unit has a VLAN table associating VLAN IDs with logical interfaces and other information.
34. (original) The VLAN tagging unit of claim 25 wherein service parameters are associated with VLAN IDs and the units are adapted to use the service parameter to affect data passing through the unit based upon the VLAN IDs.
35. (original) The VLAN tagging unit of claim 25 wherein the quality of service is determined based upon the VLAN IDs.

36. (original) The VLAN tagging unit of claim 25 wherein the VLAN tagging unit further does network address translation based on VLAN IDs.

37. (original) The VLAN tagging unit of claim 25 wherein at least one VLAN ID is used for management.

38. (original) The VLAN tagging unit of claim 25 wherein the VLAN tagging unit is adapted to associate flows coming through the Internet with separate VLAN IDs such that the elements in at least one network portion can handle the flows differently.

39. (original) The VLAN tagging unit of claim 25 wherein the VLAN tagging unit has a VLAN table of VLAN IDs and associated logical interfaces, and the VLAN table is dynamically updated during the operation of the unit.

40. (original) A system comprising: a customer network using a first VLAN ID; a first VLAN tagging unit, the first VLAN tagging unit adapted to convert VLAN frames into data in a format without a VLAN ID which is sent across a WAN to a second VLAN tagging unit; and the second VLAN tagging unit adapted to receive data in the format without a VLAN ID, the second VLAN tagging unit converting the data in the format without a VLAN ID into VLAN frames with a second VLAN ID, wherein the first and second VLAN ID need not be the same.

41. (original) The system of claim 40 wherein data is sent between the first and second VLAN tagging unit as datalink layer encapsulated IP packet.

42. (original) The system of claim 41 wherein the data link connection is a point to point protocol packet.

43. (original) The system of claim 41 wherein the packet is a multi-link point to point protocol packet.

44. (original) The system of claim 40 wherein the second VLAN tagging unit uses the logical interface from which the data is received in order to determine what second VLAN ID to associate with the data.

45. (original) The system of claim 44 wherein the second VLAN tagging unit includes a VLAN table with VLAN IDs associated with logical interfaces.

46. (original) The system of claim 40 wherein IP multiplexing is done such that the first and second VLAN tagging units associate spoof MAC addresses with WAN connections and wherein the spoof MAC addresses are provided to units on LAN connections to the first and second tagging units.

47. (original) The system of claim 40 wherein both the first and second VLAN tagging unit uses VLAN tables that associate VLAN IDs with logical interfaces.

48. (original) The system of claim 40 wherein the first and second VLAN tagging units use service parameters which affect the data transferred over the WAN.

49. (original) The system of claim 40 wherein the first and second tagging unit use a quality of service connections to distinguish between different VLAN connections.

50. (original) The system of claim 40 wherein the first and second VLAN tagging units use network address translation based upon VLAN IDs.

51. (original) The system of claim 40 wherein the first and second VLAN tagging units use certain VLAN IDs for management.

52. (original) The system of claim 40 wherein the selection of VLAN IDs is used based upon a flow-based management system.

53. (original) The system of claim 40 wherein the first and second VLAN tagging units use VLAN tables associating VLAN IDs and logical interfaces, the VLAN table being dynamically updated.

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